

Attorney Docket No. OF03P212/US
Customer No. 36872

WHAT IS CLAIMED IS:

1. A method of manufacturing a semiconductor device, comprising:

5 forming a first conductive line on a semiconductor substrate; forming an insulating layer on the semiconductor substrate and the first conductive line;

forming a plurality of via holes by selectively etching the insulating layer in order to expose the first conductive line;

10 forming a metal barrier on the insulating layer and in the via holes; and

forming a plug by depositing a conductive layer sufficiently to fill the via holes, and then planarizing the conductive layer until the conductive layer is substantially coplanar with the
15 insulating layer.

2. The method of claim 1, further comprising forming trenches by removing parts of the insulating layer surrounding the via holes to a certain thickness, after forming the plurality of via
20 holes.

3. The method of claim 1, wherein said forming a plurality of via holes comprises:

forming a first photoresist pattern on the insulating layer,
25 in order to expose parts of the insulating layer where the plurality of via holes will be formed;

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removing the parts of the insulating layer to a certain thickness by etching the parts of the insulating layer, using the first photoresist pattern as an etching mask;

forming a second photoresist pattern on the insulating layer,
5 in order to expose parts of the insulating layer where each via hole will be formed; and

forming a plurality of via holes by removing the parts of insulating layer where each via hole will be formed enough to expose the first conductive line, by etching the parts of the
10 insulating layer for each via hole using the second photoresist pattern as an etching mask.

4. The method of claim 1, wherein said forming trenches comprises:

15 forming a third photoresist pattern on the insulating layer in order to expose parts of the insulating layer where the trenches will be formed; and

forming trenches by removing the parts of the insulating layer where the trenches will be formed to a certain thickness, by
20 etching the parts of the insulating layer for the trenches by using the third photoresist pattern as an etching mask.

5. The method of claim 1, wherein the first conductive line and the plug comprise copper.